

**REMARKS**

Entry of the foregoing, reexamination and reconsideration of the subject application are respectfully requested in light of the amendments above and the comments which follow.

As correctly noted in the Office Action Summary, claims 1- 2 were pending. By the present response, claims 1 and 2 have been amended, and claims 3 and 4 added. Thus, upon entry of the present response, claims 1-4 are pending and await further consideration on the merits.

Support for the present claim amendments can be found, for example, in at least the following portions of the disclosure: the original claims; and paragraph [0009].

***OBJECTION TO THE SPECIFICATION***

The specification stands objected to under 37 C.F.R. §1.71(c) on the grounds set forth in paragraph 5 of the Official Action. The objection is believed to be based upon an alleged lack of clarity in the wording contained in paragraph 7 of the specification. By the present response, paragraph [0007] of the specification has been amended in a manner which is believed to address the above-noted objection. The present amendment to paragraph [0007] is believed to involve matters of form only, and not substance.

Reconsideration and withdrawal of the objection is respectfully requested.

***CLAIM REJECTIONS UNDER 35 U.S.C. §112***

Claim 2 stands rejected under 35 U.S.C. §112, first paragraph on the grounds set forth in paragraph 6 of the Official Action.

Claim 2 is objected to on the same grounds noted above with regard to the objection to the specification. By the present response, a similar amendment has been made to the language of claim 2, which is believed to involve matters of style only, and not substance. Reconsideration and withdrawal of the rejection is respectfully requested.

Claims 1 and 2 stand rejected under 35 U.S.C. §112, second paragraph on the grounds set forth in paragraph 8 of the Official Action.

By the present response, claim 1 has been amended in a manner which removes the limitation which was objected to on the grounds that it allegedly lacked antecedent basis. Thus, it is believed that the above-noted rejection has been obviated, without making a narrowing amendment to the claim language.

***CLAIM REJECTIONS UNDER 35 U.S.C. §102***

Claim 1 stands rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,655,860 to Oles (hereafter "*Oles*") on the grounds set forth in paragraph 10 of the Official Action. For at least the reasons noted below, this rejection should be withdrawn.

The present invention is directed to a method for milling an object. In particular, the present invention is directed to a method for milling under dry conditions, using a silicon nitride type cutting tool material under a certain set of cutting conditions.

According to the present invention it was surprisingly found that by dry machining using silicon nitride inserts at a cutting speed above 1000 m/min, and preferably at a cutting speed of 1100-2500 m/min, a longer tool life and increased productivity can be achieved. Problems associated with built-up edge wear disappeared at the above-mentioned speeds, while built-up edge wear remained at lower cutting speeds (see, e.g. - paragraph [0008]).

A method performed consistent with the principles of the present invention is set forth in amended claim 1. Amended claim 1 recites:

1. *A method of dry milling a material comprising:  
providing a silicon nitride based cutting tool insert;  
cutting at a cutting speed of 1000-3000 m/min; and  
feeding to a cutting depth of 0.2-2 mm,  
wherein the material comprises aluminum and cast iron.*

According to a further aspect, a method performed according to the principles of the present invention is set forth in new claim 3. Claim 3 recites:

3. *A method of dry milling a composite material, the method comprising:  
providing a silicon nitride based cutting tool insert;  
cutting at a speed of 1100-2500 m/min; and  
feeding to a cutting depth of 0.2-2 mm.*

*Oles* fails to anticipate the presently claimed invention.

*Oles* is directed to a milling cutter and method for milling a work piece. The device and method of *Oles* is directed primarily to a cutting insert and wiper configuration.

With regard to the claimed method, it is alleged in paragraph 10 of the Official Action that:

Milling conditions for one of the tests that yielded desirable results (e.g., no burr) included dry milling with a silicon nitride milling insert (col. 5, lines 45-65). . .

However, contrary to the above-quoted assertion, *Oles* fails to disclose dry milling with a silicon nitride insert as alleged. The portion of the disclosure appearing in column 5, lines 45-65 have been cited in support of the assertion. However, a review of this portion of the disclosure reveals that no reference whatsoever is made with regard to a milling operation performed without the benefit of a coolant. → see col 6 l. 26

For at least the reason noted above, reconsideration and withdrawal of the rejection is respectfully requested.

Newly presented claim 3 is also directed to a dry milling method. Thus, claim 3 is also distinguishable over *Oles* for at least the same reason noted above.

***CLAIM REJECTIONS UNDER 35 U.S.C. §§102/103***

Claim 2 stand rejected under 35 U.S.C. §102(b) as being anticipated by or, in the alternative, under 35 U.S.C. §103(1) as obvious over *Oles* as applied to claim 1 above on the grounds set forth on page 12 of the Official Action. For at least the reasons noted below, this rejection should be withdrawn.

As noted above, *Oles* fails to anticipate claim 1. Thus, claim 2, which depends from claim 1, is also distinguishable for at least the same reasons noted above.

With regard to the recited "chip thickness," it is acknowledged that *Oles* fails to contain any disclosure whatsoever in this regard. Nonetheless, it is asserted that despite any identifiable teaching in the prior art, this aspect of the presently claimed invention would have been obvious to one of ordinary skill in the art. In re Aller is cited in support of this proposition. This assertion is incorrect.

In re Aller is inapplicable to the current situation. First, contrary to the above-noted assertion, prior art does not disclose the "general conditions" of the presently claimed method. As readily acknowledged, the applied prior art is entirely devoid of any disclosure whatsoever concerning chip thickness. Thus, the present situation is not one in which a disclosed variable has been optimized. Second, the rationale applied in the grounds for rejection is appropriate only when the prior art recognizes the limitation in question as being a result effective variable. See, MPEP §2144.05. Since there has been no teaching identified in the prior art recognizing chip thickness as a result effective variable, the rationale used in the grounds for rejection is clearly inappropriate. Reconsideration and withdrawal of the rejection is respectfully requested.

**CONCLUSION**

From the foregoing, further and favorable action in the form of a Notice of Allowance is earnestly solicited. Should the Examiner feel that any issues remain, it is requested that the undersigned be contacted so that any such issues may be adequately addressed and prosecution of the instant application expedited.

Respectfully submitted,

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Attachment to Amendment dated February 14, 2003

**Marked-up Copy**

Paragraph [0007], Beginning at Page 3

[0007] A method of milling a material provides a silicon nitride based cutting tool insert, cuts at a cutting speed of 1000-3000 m/min, and feeds at a feeding rate of 0.05-0.5 mm/tooth to a cutting depth of 0.2-2 mm. The cutting tool insert [has] produces a chip thickness of 0.09-0.17 mm. The material milled can comprise aluminum and cast iron.

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**Attachment to Amendment dated February 14, 2003**

**Marked-up Claims 1 and 2**

1. (Amended) A method of dry milling a material comprising:  
providing a silicon nitride based cutting tool insert;  
cutting at a cutting speed of 1000-3000 m/min; and  
feeding [at a feeding rate of 0.05-0.5 mm/tooth] to a cutting depth of 0.2-2

mm,

wherein the material comprises aluminum and cast iron.

2. (Amended) The method of claim 1, wherein the cutting tool insert [has]

produces a chip thickness of 0.09-0.17 mm.

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